

A REVISION OF *VERBESINA* SECTION *PLATYPTERIS* (ASTERACEAE: HELIANTHEAE)

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ABSTRACT

A revision of *Verbesina* section *Platypteris* is presented. Five species are recognized in the section: *V. crocata*, *V. vallartana*, *V. lottiana*, *V. fraseri* and *V. ovatifolia*. A distribution map and one figure are provided.

Verbesina is a large, New World genus comprised of ca 300 species. Robinson and Greenman (1899), in the most recent synopsis of *Verbesina*, recognized 109 species distributed in 12 sections. Since this treatment, several of the sections have been revised (Blake 1925 [*Lipactinia*]; Coleman 1964, 1966a, b [*Pterophyton*, *Sonoricola* and *Ximenesia*]; Olsen 1985, 1986 [*Ochractinia* and *Verbesina*]; Turner 1986 [*Pseudomontanoa*]); the present study brings the total to eight.

Kunth (1820) described a monotypic genus, *Platypteris*, noting affinities with *Salmea*, *Bidens* and *Spilanthes* and indicating an association with *Verbesina*, from which it was said to differ in characters of the involucre and its discoid heads. De Candolle (1836) treated *Platypteris* as a section of *Verbesina* and included in it the three known orange-flowered, discoid species, *V. crocata*, *V. auriculata* and *V. arborea*. Robinson and Greenman (1899) retained the former, but transferred the latter two species to section *Lipactinia* on the basis of their alternate leaves and small heads. As recognized by Robinson and Greenman, section *Platypteris* included those taxa with opposite leaves, winged stems and large, discoid, subglobose heads. The section included four taxa, *V. crocata*, *V. fraseri* (with variety *nelsonii*) and *V. ovatifolia*. Greenman (1904) added another taxon, *V. tonduzii* and Turner and Olsen (1988) added *V. vallartana* and *V. lottiana*. The present study reduces *V. tonduzii* to synonymy under *V. ovatifolia*, thus five species are recognized for the section.

Section *Platypteris* occurs from western Mexico (Durango to Colima) east and south through Central America to Costa Rica. No Panamanian or South American specimens have been found in the herbaria examined. Usually noted as a montane element, members of section *Platypteris* often occur in deciduous forests and have been collected at elevations ranging from near sea level up to ca 2100 m.

MORPHOLOGY: Section *Platypteris* includes perennial robust herbs and sprawling or clambering shrubs, bearing capitulescences ranging from solitary to several headed cymes or cymose panicles. The heads in this group are almost always discoid, although there is occasionally differentiation in size between outer and inner disk florets, with yellow-orange to red disk corollas. McVaugh (1984), in his discussion of *V. crocata*, indicates that the discoid nature of the heads that characterizes section *Platypteris* (and a few other species) "... does not seem to be firmly fixed." This is true also in section *Ochractinia* (Olsen 1985) and in section *Lipactinia* (Blake 1925). Indeed, Blake notes that "It has gradually become apparent that the absence of rays, the principal character, in connection with the small heads, on which the section is based, is not absolutely distinctive of the group, since some of the species related to *V. arborea*, and even that species itself according to Hieronymous, occasionally or always have a few small rays." Thus, it is clear that the taxonomic use of 'discoid heads' within *Verbesina* is to be used with caution, with greater reliance placed upon the size and number of heads and phyllotaxis.

The most useful diagnostic character for this section is the shape of the involucre bracts, which varies from linear-lanceolate in *V. crocata* to ovate-lanceolate in *V. ovatifolia* and *V. lottiana* to the broadly obovate or spatulate bracts seen in *V. fraseri*, and *V. vallartana* (Figure 1).

Leaf morphology within section *Platypteris* is variable and rarely provides useful taxonomic characters. It is not uncommon to find both simple and pinnately-lobed leaves in the same taxon and even on the same plant. Turner (pers. comm.) notes that *V. ovatifolia* may contain simple, 3-lobed, 5-lobed or 7-lobed leaves on garden-grown material, the younger, uppermost leaves being simple or 3(5)-lobed. Pubescence on the leaves is always harsh.

CHROMOSOME NUMBERS: The genus *Verbesina* is apparently monobasic with $x = 17$ (Stuessy 1977). The only apparent exception to this is *V. crocata*, which has been reported as $n = 18$ (Turner, Ellison and King 1961; Turner, Powell and King 1962) and $n = 17$ (Keil and Stuessy 1977). *V. ovatifolia* was recently reported as $2n = 17II + 1B$ (Sundberg, Cowan and Turner 1986). The presence of B chromosomes may explain the two earlier reports of $n = 18$ for *V. crocata*. The remaining three species in section *Platypteris* have not been examined and additional work is needed to clarify the conflicting reports for *V. crocata*.

CHEMISTRY: There is a single published study of a species belonging to section *Platypteris*. Notes on herbarium sheets of *V. ovatifolia* indicate the odor of turpentine (eg. Nee 22590). Volatile components have not been surveyed, however, Fang et al. (in press) examined the non-polar

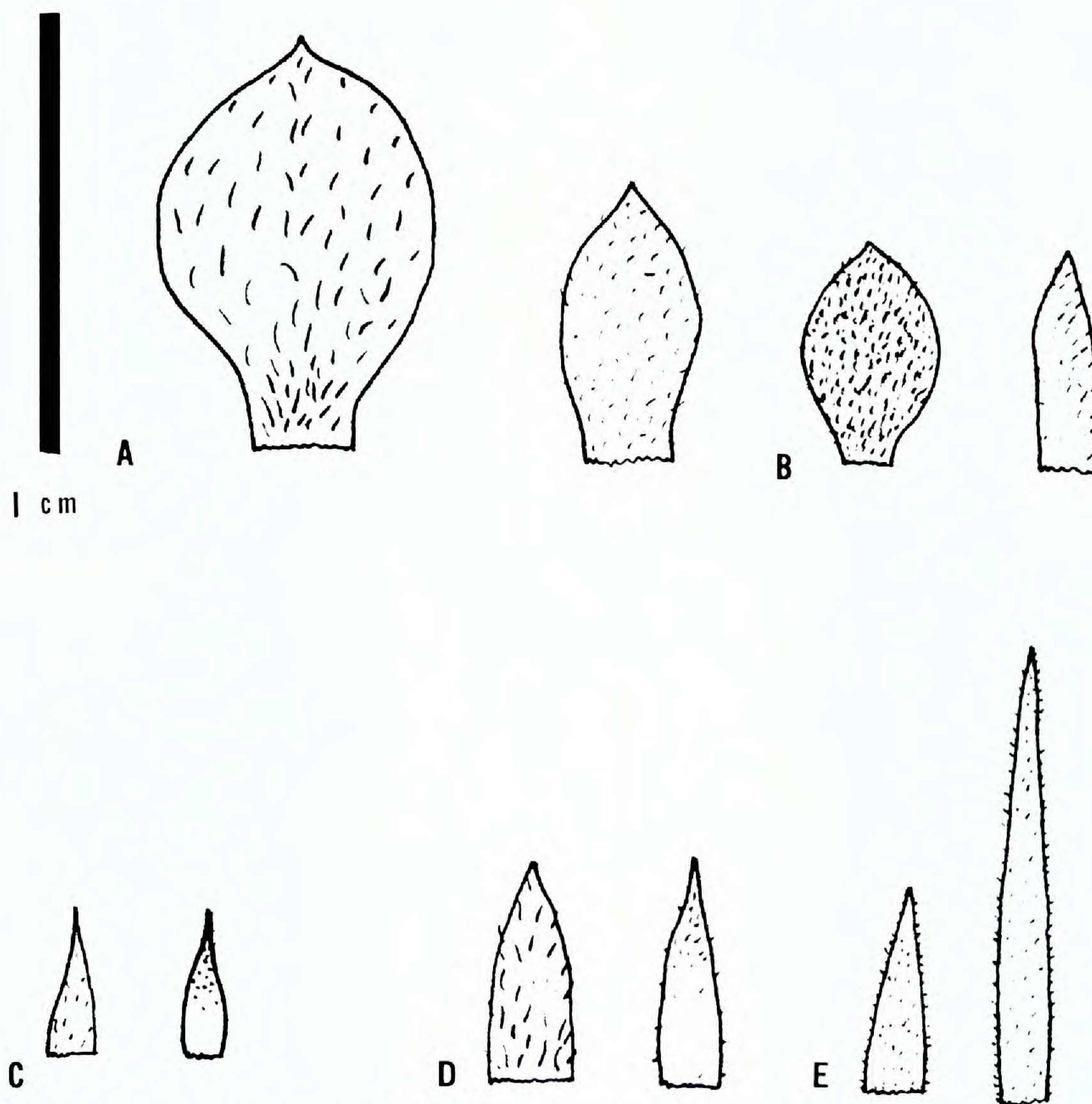


FIG. 1. Outer (left) and inner (right) involucral bracts in *Verbesina* section *Platypteris*: A. *V. fraseri* (Molina and Molina 24900, NY), B. *V. vallartana* (Feddema 2584, MICH), C. *V. lottiana* (McVaugh 25077, MICH), D. *V. ovatifolia* (Dryer 1663, F), E. *V. crocata* (King 2538, MICH).

components of this species and found no flavonoids or sesquiterpene lactones. Flavonoids were observed in an aqueous extract, however this has not yet been investigated. Other species in the section remain to be examined.

VERBESINA SECTION PLATYPTERIS (Kunth) DC., Prodr. 5:617. 1836. TYPE: *Platypteris crocata* Kunth, in, Humboldt, Bonpland and Kunth, Nov. Gen. Sp. 4:200. 1820.

Herbs or erect or clambering shrubs to 8 m high; stems up to 4 cm across, winged; scabrous. Leaves opposite, simple to pinnately lobed;

scabrous. Capitulescence solitary or few-headed cymose panicles. Heads discoid; involucre, 2–7 seriate, bracts linear-lanceolate to broadly ovate or obovate. Corollas yellow-orange to red, variously pubescent. Achenes gray-white to brown, glabrous to tuberculate, broadly winged; pappus of 2 subequal awns.

KEY TO THE SPECIES

- A. Involucre 4–7 seriate, phyllaries linear-lanceolate, 3.5–10 times as long as wide 1. *V. crocata*
- AA. Involucre 2–4 seriate, phyllaries broader, <3 times as long as wide
 - B. Involucral bracts broadly ovate to obovate or spatulate ca 2–2.5 times as long as wide
 - C. Leaves usually lobed; outer phyllaries <6 mm long; corollas densely pubescent 2. *V. vallartana*
 - CC. At least the upper leaves simple; outer phyllaries <8 mm long; corollas glabrous to sparsely pubescent 3. *V. fraseri*
 - BB. Involucral bracts ovate-lanceolate
 - C. At least the upper leaves simple, petioles not auriculate at the base; achenes glabrous, awns to 3.5 mm long 4. *V. ovatifolia*
 - CC. Leaves usually pinnately lobed, petioles auriculate at the base; achenes puberulent, awns to 1.5 mm long 5. *V. lottiana*

1. *VERBESINA CROCATATA* (Cav.) Less., Syn. Gen. Compos. 232. 1832. TYPE: "Habitat in Mexico. Vidi floridam in dicto horto mense Februario et Martio." (the plate serves as the type).—*Bidens crocata* Cav., Icon. 1:66, pl. 99. 1791.—*Spilanthes crocata* (Cav.) Sims, Bot. Mag. 39: pl. 1627. 1814.—*Platypteris crocata* (Cav.) Kunth, Nov. Gen. Sp. 4:201. 1820.

Clambering shrub to 8 m high. Stems winged, hispidulous below, becoming more dense in the capitulescence. Leaves mostly opposite, deltoid-ovate in outline, simple or coarsely pinnately 3–7 lobed; blade to 14.5 cm long, 9.5 cm wide, apex acuminate, margin irregularly serrate, pubescence above coarse with short, broad-based hairs, below confined mainly to the veins, less dense, the hairs not broad-based, somewhat longer than on the upper surface; main veins conspicuously raised beneath; petiole broadly winged, to 7 cm long. Capitulescence a loose panicle of 1–5 heads; peduncles to 20 cm long, hispidulous; heads large, discoid, 2.0–3.5 (–5.0) cm wide, 1.5–2.5 (–3.0) cm tall. Involucre grayish, 4–7 seriate; phyllaries linear-lanceolate, outer series 3.5–4.5 mm long, 1.0–1.4 mm wide, usually somewhat reflexed, densely covered with short hairs, ciliate-margined with similar hairs, base indurate, apex narrowly acute; inner series grading into the pales, to 13 mm long, 1.2–1.5 mm wide. Pales linear-lanceolate, to 12 mm long, sparsely pubescent along entire length with short hairs, ciliate along the upper 1/3,

apex acuminate. Disk florets ca 100–200; corollas orange, outer florets smaller, corolla to 3.5 mm long, tube to 1.0 mm long, inner florets larger, corolla cylindric, 6.5–8.0 mm long, 1.0–1.2 mm wide, pubescent only on the upper 1/2–1/5; tube often greenish, 1.0–1.5 mm long, very sparsely pubescent. Anthers yellow, apices acute. Achenes obovate, shiny brown to grayish-white, 5.5–8.2 mm long, 1.5–2.0 mm wide (excluding the wings), mostly glabrous or with a few thin hairs near the apex; wings thin, 2.0–2.3 mm wide, attached above to the awns for about 1/3 the length of the awns; pappus of 2 subequal awns to 4.2 mm long. Flowering year round.

Representative specimens: MÉXICO. Durango: 6 km al S de Huazamota, mcpo. El Mexquital, 700 m, 7 May 1983, *Gonzales & Rzedowski* 2405 (MEXU, TEX). Guerrero: Cañon de la Mano Negra, 4–8 km N of Iguala, 1100–1150 m, 15 Feb 1970, *Anderson & Anderson* 5774 (MICH); 3 km al W de Chilpancingo, 1350 m, *Blanco & Toledo* 136 (MEXU); Calavera, 1000 m, 4 Oct 1937, *Hinton, et al.* 10039 (GH, LL). Jalisco: Subtropical deciduous forest ca 11 mi S of Acatlán, 4200 ft, 5 Nov 1962, *Cronquist* 9808 (GH, MEXU, MICH, NY, TEX). México: Ixtapan, District of Temascaltepec, 1000 m, 2 Nov 1932, *Hinton* 2476 (MEXU, US); Ixtapan, Ciudad Arenal, 1950 m, 21 Dec 1952, *Matuda* 27500 (ENCB, MEXU). Michoacan: Huetamo, 28 Feb 1934, *Hinton, et al.* 5707 (GH, NY, US); En los Laureles, 12 Mar 1978, *Nuñez* 612 (MEXU); Al 21 km al SW de Zitácuaro, entre las Trincheras y Laureles, 1450 m, 18 Mar 1981, *Nuñez, et al.* 3665 (MEXU). Morelos: Cuantla, 1200 m, 19 Dec 1908, *Conzatti* 2329 (F, GH); 4 mi W of Yautepec on Hwy 190, 28 Dec 1970, *Dunn, et al.* 17369 (ENCB, NY); Along, rte 95 ca 11 mi S of Cuernavaca, 14 Mar 1961, *King* 4159 (F, MICH, NY, TEX, UC, US); Valley of Cuantla, 4000 ft, 28 Oct 1900, *Pringle* 9062 (F, GH, MEXU). Oaxaca: Mcpo. El Barrio, ca 5 km al S de Almoloya, 750 m, 13 Nov 1978, *Koch, et al.* 78279 (ENCB, MEXU). Puebla: Atlixco, 1600 m, May 1899, *Conzatti* 928 (GH); Along rte 190, ca 7 mi N of the Oaxaca - Puebla border, 1 Feb 1960, *King* 2536 (MICH, TEX, US); Along rte 190 ca 1 mi S of Acatlán, 1 Feb 1960, *King* 2538 (MICH, TEX).

Commonly known as “capitaneja” or “nahuitiput”, *V. crocata* has a long history of taxonomic confusion; the name has been applied to almost any large-headed, orange-flowered *Verbesina* from the west coast of México through Central America. As recognized here, *V. crocata* is restricted to an area of south-central México, from eastern Michoacan north into Durango, south and east to the states of Puebla and Oaxaca (Figure 2) at elevations of 50–2100 meters. It is clearly separated from other members of section *Platypteris* on the basis of its 4–7 seriate involucre with linear-lanceolate phyllaries. It also has the largest heads in the section (up to 5 cm across). Although members of *V. lottiana* may approach *V. crocata* in phyllary shape, *V. lottiana* has a 2–4 seriate involucre, consistently smaller heads and shorter pappus awns.

Verbesina crocata is the only member of section *Platypteris* with any reputed medicinal value; it has been used as a “remedy for wounds.” Label

data also indicate that the leaves can be bruised and immersed in water for a cool drink.

2. *VERBESINA VALLARTANA* B. Turner & J. Olsen, *Sida* 13:39. 1988. TYPE: MÉXICO. JALISCO: ca 10 km NE of Puerto Vallarta, near the village of Milagro, on the road to Mascota, tropical deciduous forest with *Brosimum*, 100 m, 15 Nov 1963. *Feddema* 2584 (HOLOTYPE: TEX!; ISOTYPES: ENCB!, MICH!, NY!).

Turner & Olsen (1988) provide both a description and a list of representative specimens for *Verbesina vallartana*. This taxon is the most geographically restricted of the taxa in section *Platypteris* (Figure 2). It approaches *V. fraseri* in leaf and phyllary morphology but is easily distinguished on the basis of its densely pubescent corollas.

3. *VERBESINA FRASERI* Hemsl., *Biol. Cent. -Amer., Bot.* 2:187–188. 1881. TYPE: GUATEMALA: Dueñas, hillside, 5000 ft., 10 Oct 1873, *Fraser, Salvin and Godman* (2) (HOLOTYPE: K!).

Robust herbs or clambering shrubs to 3 m high. Stem winged, glabrous below, becoming hispidulous in the capitulescence. Leaves opposite, petiolate, ovate to deltoid in outline, simple to coarsely 3–5 pinnately lobed; blade to 24 cm long, 14 cm wide, apex acuminate, margins serrate, base narrowing abruptly to the petiole, pubescence above coarse with short broad-based hairs, below softer with more numerous, longer hairs lacking the thickened bases; petiole narrowly winged, to 5 cm long. Capitulescence of 1 to several heads borne on hispidulous peduncles to 12 cm long; heads discoid, 1.5–3.0 cm wide, 1.0–1.5 cm tall. Involucre gray-green, 2–3 seriate; phyllaries broadly ovate to obovate, outer phyllaries 8–12 mm long, 3–6 mm wide, strongly reflexed, pubescent with short broad-based hairs, margin entire, base indurate, apex broadly acute; inner series narrower, to 10 mm long, 2–3 mm wide. Pales lanceolate, 7–8.5 mm long, pubescent on upper 1/2–1/3, ciliate margined along upper 1/2, apex acuminate, subherbaceous. Disk florets numerous, ca 100–150, corollas orange, cylindric, 6.0–8.0 mm long, 1.3–2.0 mm wide, sparsely pubescent; tube 1.0–1.5 mm long, glabrous to very sparsely pubescent, anthers light in color, apices acute. Achenes obovate, grayish-white, 5.5–6.5 mm long, 1.5–2.0 mm wide (excluding the wings), glabrous; wings 1.5–2.0 mm wide, margins entire, attached to the awns for about 1/3 the length of the awns; pappus of 2 subequal awns to 3.5 mm long. Flowering Nov-Apr.

Representative specimens. EL SALVADOR. Ahuachapán: Lagunita de las Ninphas, high above town of Apaneca, 5 Dec 1978, *Funk & Langdon* 2941 (US); vicinity of Ahuachapán, 700–1100 m, 16–25 Jan 1947, *Standley & Padilla* 2599 (F). La Libertad: Hacienda Cuyagualo, S of Lago de Zapotitlan along Rio Gualo, 27 Jan 1946, *Carlson* 305

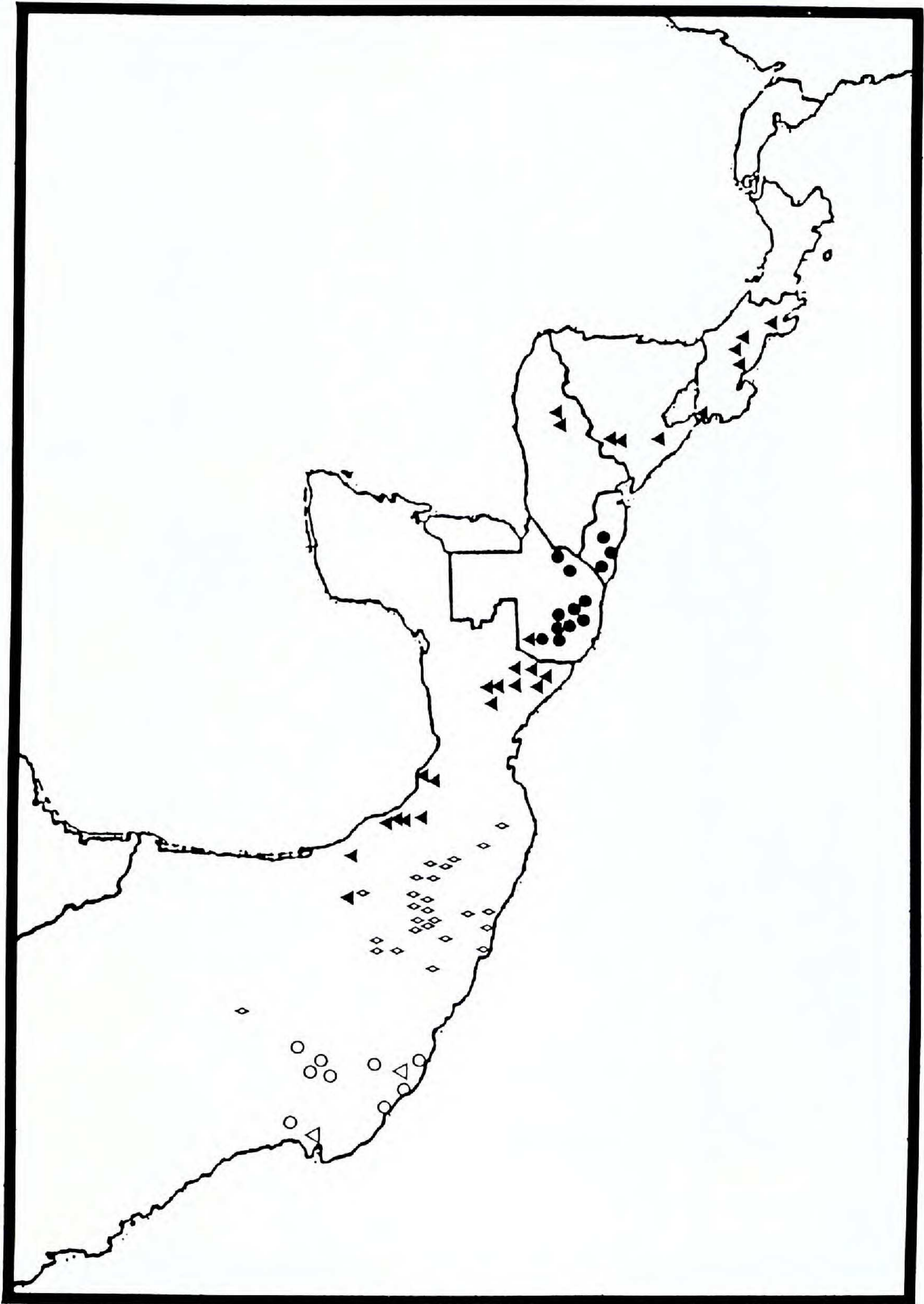


FIG. 2. Distribution of the taxa of *Verbesina* section *Platypteris*: open triangles, *V. vallartana*; open circles, *V. lottiana*; open diamonds, *V. crocata*; solid triangles, *V. ovatifolia*; solid circles, *V. fraseri*.

(F); slopes of Volcán San Salvador, above Santa Tecla, 1230 m, 22 Jan 1949, *Williams & Molina* 15227 (F). **SAN SALVADOR:** San Salvador, 1921, *Calderon* 165 (GH, US); dense forest of El Picacho NE of El Boqueron, Volcán San Salvador, 1950 m, 1 Mar 1968, *Molina & Montalvo* 21856 (F); vicinity of San Salvador, 650–850 m, 20 Dec 1921–4 Jan 1922, *Standley* 19140 (NY, US); Volcán de San Salvador, 1000–1800 m, 7 Apr 1922, *Standley* 22980 (GH, NY, US). **GUATEMALA. Alta Verapaz:** near Cobán, 1260–1440 m, 25 Mar–15 Apr 1939, *Standley* 71458 (F); 1350 m, Nov 1907, *Von Turckheim* 1879 (GH, NY, US); Cobán, 1350 m, Nov 1912, *Von Turckheim* 3985 (F, US); 1–8 km NW of Cobán, 1200–1300 m, 4 Jan 1973, *Williams, et al.* 42041 (F, US). **Chimaltenango:** Alameda, 25 Nov 1936, *Johnston* 489 (F); Chimaltenango, 1260 m, 26 Jan 1947, *Williams & Molina* 11841 (F). **Chiquimula:** Cerro Brujo, in vicinity of Rio Negro, below Montaña Montenegro near village of Cerro Brujo, 1500–2000 m, 1 Nov 1939, *Steyermark* 30965 (F). **Escuintla:** 6 mi N of Escuintla on CA-9, 2400 ft, 7 Nov 1970, *Harmon* 4660 (ENCB, NY); along road to Escuintla, ca 16 km SW of Amatitlán, 2750 ft, 23 Jan 1977, *King* 7167 (NY, US); along Rio Guacalate, 500–550 m, 28 Nov 1938, *Standley* 58275 (F). **Guatemala:** along Rio Villalobos, 1300 m, 12–23 Jan 1966, *Molina, et al.* 16072 (F, GH, NY, US); near Amatitlán, 1170 m, 29 Dec 1938, *Standley* 61263 (F, GH); 4 mi NE of Guatemala City, road to Chinautla, 4400 ft, 20 Nov 1943, *White* 5131 (ENCB, F, LL, MICH). **Huehuetenango:** vicinity of Tachique, E of Huehuetenango, 1900 m, 7 Jan 1941, *Standley* 82596 (F). **Sacatépequez:** Volcán Acatenango, 9000 ft, 20 Feb 1905, *Kellerman sn* (F); between Santa Maria de Jesus and San Juan de Obispo, 1700 m, 27 Nov 1969, *Molina & Molina* 24900 (F, NY); slopes of Volcán de Agua, N of Santa Maria de Jesus, 1800–2100 m, 10 Dec 1938, *Standley* 59347 (F); near Pastores, 1560–1650 m, 14 Dec 1938, *Standley* 59941 (F, NY); near Antigua, 1500–1600 m, Nov 1938–Feb 1939, *Standley* 60380 (F); along Rio Guacalate, on road between Antigua and Chimaltenango, 1660 m, 23 Dec 1940, *Standley* 81030 (F); 10 km N of Antigua, 1700 m, 30 Jan 1949, *Williams & Molina* 15416 (F, GH); lower slopes of Volcán de Fuego, 3 km SW of Alotenango, 1200–1300 m, 15 Jan 1974, *Williams & Williams* 43465 (F, MICH). **Santa Rosa:** Jumaytepeque, 6000 ft, Nov 1892, *Heyde & Lux* 4236 (F, GH, MICH); Cuijiniquilapa, 800 m, Nov 1893, *Heyde & Lux* 6171 (F, GH, US); near Cuilapa, 895 m, 20–27 Nov 1940, *Standley* 78550 (F). **Sololá:** entre Puente Panajachel y el Rio, 1800 m, 30 Oct 1965, *Williams & Molina* 15277 (F, NY, US). **Quetzaltenango:** south facing slopes of Volcán Santa Maria, between Finca Pirineos and Los Positos, between Santa Maria de Jesus and Calahuache, 1300–1500 m, 8 Jan 1940, *Steyermark* 33733 (F).

Common names for this taxon include “esponja” and “valeriana.” *Verbesina fraseri* is entirely Central American, found only in Guatemala, El Salvador and Honduras (Figure 2), where it occurs at elevations of 300–2000 meters. Most closely related to the more northerly distributed *V. ovatifolia*, *V. fraseri* is easily distinguished by its broad, strongly reflexed involucre bracts.

4. *VERBESINA OVATIFOLIA* A. Gray, Proc. Amer. Acad. Arts 19:15. 1883.
 TYPE: MÉXICO. CHIAPAS. Nov 1864–1870, *Ghiesbreght* 523 (HOLOTYPE: GH!;
 ISOTYPE: K!).

Verbesina tonduzii Greenman, Proc. Amer. Acad. Arts 40:42. 1904. TYPE: COSTA
 RICA. SAN JOSÉ: Dans les boissons a las Vueltas, Tucurrique, 635 m, Nov 1898,
Tonduz 12765 (LECTOTYPE: GH!; ISOTYPES: F! GH! MICH! UC! US!).

Verbesina fraseri var. *nelsonii* Donn.-Smith, Bot. Gaz. 23:9. 1897. TYPE: GUATEMALA. HUEHUETENANGO: near Nenton, 3000 – 4000 ft 13 – 15 Dec 1895. *Nelson 3551*. (LECTOTYPE: US!; ISOTYPE: US!).

Robust herbs to clambering shrubs to 7 m tall. Stems reddish, conspicuously winged by continuation of the petiole wings extending the length of the internodes; hispidulous, becoming denser in the capitulescence. Leaves opposite, mostly simple above, broadly ovate to deltoid in outline, pinnately 5 – 7 lobed below, apex acuminate, margins serrulate to irregularly serrate, blade to 17 cm long, 15 cm wide, pubescence scabrous above, lower surface similar, but less dense; petiole to 4 cm long, winged. Capitulescence solitary to few paniculate; peduncles to 14 cm long when heads are solitary, shorter when several heads are present; heads discoid, 2.0 – 3.5 cm in diameter, 1.5 – 2.0 cm tall. Involucre 2 – 4 seriate; phyllaries ovate-lanceolate, densely puberulent, weakly ciliate-margined, apex acute, not reflexed, base indurate, outer bracts 2.5 – 8.5 mm long, 1.3 – 3.5 mm wide, inner series lanceolate, grading into the pales, to 8 mm long, 1.5 mm wide, less puberulent than outer series. Pales linear-lanceolate, to 8.5 mm long, pubescent on upper 1.3, apex acuminate, herbaceous, margin not markedly ciliate. Disk florets numerous, ca 100 – 150. corollas yellow to orange, cylindric, 6.0 – 9.0 mm long, 1.8 – 2.5 mm wide, lobes sparsely pubescent, tube greenish, 1.3 – 1.5 mm long, ca 0.25 mm wide, glabrous to sparsely pubescent; anthers light colored, apex acute. Achenes obovate, brown to gray in color, 4.7 – 7.7 mm long, 1.5 – 2.0 mm wide (excluding the wings), glabrous; wings to 2.5 mm wide, very weakly ciliate to entire, attached above to the pappus awns for ca 1/3 the length of the awns; pappus of 2 unequal awns to 3.5 mm long. Flowering year round.

Representative specimens: **COSTA RICA**. Alajuela: Entre Calera de San Ramon y Rio Jesus, 23 Dec 1927, *Brenes 5921* (F, NY); Carrillos, de Poas, 26 Oct 1931, *Brenes 14346* (F); Bordes del Rio Burio, 20 Feb 1964, *Jimenez 1763* (F, US); along stream in wet rain forest region, near Fortuna, 150 m, 21 Feb 1966, *Molina, et al. 17633* (F, US). **Cartago**: San Pedro, 500 – 600 m, 27 Dec 1928, *Brenes 6525* (F); forest, high over Rio Reventazon, 950 m, 11 Apr 1972, *Lent 2486* (F, NY, US); Terrenos del Instituto Interamericano de Ciencias Agricolas, Turrialba, 600 m, 17 Nov 1949, *Leon 1968* (US). **Guanacaste**: vicinity of Cañas, Finca Taboga, 28 Dec 1969, *Daubenmire 482* (F, US); Monteverde, Cordillera de Tilarán, 1250 – 1350 m, Oct 1977, *Dryer 1663* (F, US); along stream ca 11 km N of La Cruz, 0.5 km W of main road, 0 – 150 m, 2 Feb 1978, *Liesner 4854* (F); vicinity of Libanno, 260 – 360 m, 15 Jan 1926, *Standley 44914* (GH, US); escarpment from the savanna down to Rio Guajiniquil on Bahia de Santa Elena, 50 – 200 m, 5 Jan 1964, *Williams, et al. 26718* (F, US). **Puntarenas**: Buenas Aires, Jan 1892, *Pittier 4905* (GH). **San José**: Santa Rosa de Puriscal, 13 Dec 1982, *Poreda, et al. 3384* (F, US); along a small stream ca 1.4 km NW of Brazil de Santa Anna, 800 m, 21 Dec 1974, *Taylor 17366* (US); San José, 850 m, 16 Nov 1966, *Weston 3271* (UC). **GUATEMALA**. Huehuetenango:

Cayon El Tapon on hwy to La Mesilla, 1000 – 1400 m, 9 Jan 1974, *Molina* 30138 (ENCB, F, MICH). **HONDURAS.** Olancho: vicinity of Juticalpa, 380 – 480 m, 5 – 16 Mar 1949, *Standley* 17390 (F); vicinity of Catacamas, 450 – 500 m, 18 – 26 Nov 1949, *Standley* 18167 (F). **MEXICO.** Chiapas: Mcpo. Ocozocoautla de Espinosa, 32 km N of Ocozocoautla along road to Mal Paso, 2500 ft, 19 Oct 1965, *Breedlove & Raven* 13581 (ENCB, F, MICH, NY, US); Mcpo. Motozintla de Mendoza, near Ojo de Agua, 2000 m, 14 Dec 1976, *Breedlove* 42704 (MEXU); Mt. Ovando, 14 – 18 Nov 1939, *Matuda* 3949 (GH, MEXU, MICH, NY); above Finca Carmen along the road from Acala to Pugiltik, Mcpo. Venustiano Carranza, 1800 ft, 7 Nov 1967, *Ton* 3187 (ENCB, F, MICH); Mcpo. San Fernando, Mirador Roblar, 19 km N de Tuxtla Gutierrez, sobre carretera a Cañon El Sumidero, 3 km S de Mirador Las Chiapas, 1290 m, 9 Dec 1979, *Wendt* 2377 (MEXU, TEX). **Hidalgo:** Pachuca, 2500 m, 8 Apr 1951, *Gold* 10 (NY). **Oaxaca:** District of Tuxtepec, Chiltepec and vicinity, 20 m, Jul 1940 – Feb 1941, *Calderón* 325 (GH, LL, MEXU, US); Chiltepec, 200 m, 2 Nov 1941, *Calderón* 770 (GH, MEXU, MICH, US). **Vera Cruz:** Isla de Catemaco, 8 Oct 1970, *Calzada* 31 (F, GH, MEXU, US); Las Cabanas, 5 km N de la desviacion de la carretera que va al Jical, Catemaco, 22 Oct 1974, *Calzada* 01614 (ENCB, NY); Region of San Andrés Tuxtla, Laguna Encantada, 24 Aug 1953, *Dressler & Jones* 168 (GH, MEXU); E side of entrance of Laguna de Sontecomapan into the Gulf of Mexico, 7 km NE of Sontecomapan, Mcpo. Catemaco, 0 – 50 m, 1 Nov 1981, *Nee* 22590 (F, TEX, US); Zacuapan, Barranco de Tenampa, Nov 1906, *Purpus* 2184 (F, GH, UC, US); Coyame, 400 m, 22 Oct 1968, *Rosas* 1394 (F, MEXU, MICH, US); Teocelo, 1000 m, 15 Nov 1971, *Ventura* 4497 (ENCB, LL, MICH, NY, TEX); San Pablo, Mcpo. Naolinco, 950 m, 5 Nov 1981, *Ventura* 19070 (ENCB); 3 – 7 km NW of Pueblo Nuevo, 600 – 700 m, 24 Nov 1973, *Williams & Molina* 42400 (MICH, US). **NICARAGUA.** 8 Oct 1927, *Chaves* 336 (US). **Managua:** Sierra de Managua, 600 – 900 m, *Garnier* 186 (LL, US); Casa Colorada and vicinity, S of Managua, 850 m, 27 June 1923, *Maxon, et al.* 7361 (US).

The very brief original description by Gray (1883) was not expanded upon by Robinson and Greenman (1899), nor was this taxon mentioned in either Greenman's (1904) discussion of *V. tonduzii* or Nash's (1976) treatment of Guatemalan Verbesinas. Donnell-Smith's *V. fraseri* var. *nelsonii* was apparently not seen by Robinson and Greenman, who note only that it was "Said to have leaves lobed and heads smaller than in the typical form."

Commonly referred to as "guaco rojo" and also known as "capitaneja," *Verbesina ovatifolia* is found from Vera Cruz south into Costa Rica (Fig. 2) at elevations ranging from 50 meters to ca 1500 meters. Gray (1883) indicated that a close relationship exists between *V. ovatifolia* and *V. fraseri*. These two taxa are sympatric in Guatemala and probably also in Honduras, El Salvador and Nicaragua, although collections of both taxa from the same locality are not known from these countries. Morphologically, *V. ovatifolia* is closest to *V. crocata*, from which it differs in its broader involucre bracts (though not nearly so broad as in *V. fraseri*) and its smaller, more numerous heads. *Nee* 22590 from near sea level in Vera Cruz has broader, more reflexed involucre bracts than other specimens seen of *V. ovatifolia*, and B.L. Turner (pers. comm.) indicates that he has seen another specimen

from the Chiapas-Oaxaca border with similar characters. These are best treated within *V. ovatifolia* on the basis of their overall morphology, even though the characters of the involucre would place them into *V. fraseri*.

5. VERBESINA LOTTIANA B. Turner & J. Olsen, Sida 13:41. 1988. TYPE: MÉXICO. JALISCO: Municipio La Huerta, Estacion de Biología Chamela (UNAM), 19 30' x 105 03', 12 Oct 1982, Lott & Hernandez 1474. (HOLOTYPE: TEX!; ISOTYPES: ENCB!, UNAM!).

Turner & Olsen (1988) provide both a description and a list of representative specimens for *Verbesina lottiana*. A western Mexican species (Figure 2), the recently described *V. lottiana* was included within *V. crocata* by McVaugh (1984). It is easily distinguished from the latter by its involucre. *V. crocata* has linear-lanceolate involucre bracts in 4–7 series, while *V. lottiana* has ovate bracts in fewer series.

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REFERENCES

- BLAKE, S.F. 1925. On the status of the genus *Chaenocephalus* with a review of the section *Lipactinia* of *Verbesina*. Amer. J. Bot. 12:625–640.
- COLEMAN, J.R. 1964. A taxonomic revision of sections *Pterophyton*, *Sonoricola* and *Ximenesia* of the genus *Verbesina* (Compositae). Ph.D. Thesis. Indiana University.
- . 1966a. A taxonomic revision of section *Sonoricola* of the genus *Verbesina* (Compositae). Madroño 18:129–137.
- . 1966b. A taxonomic revision of section *Ximenesia* of the genus *Verbesina* (Compositae). Amer. Midl. Nat. 76:475–481.
- DECANDOLLE, A.P. 1836. *Verbesina*. Prodr. Systematis Naturalis Regni Vegetabilis 5:612–619. Paris, Strasborg, London.
- FANG, N., TURNER, B.L. and T.J. MABRY. 1988. Non-polar constituents of *Verbesina ovatifolia* (sect. *Platypteris*) Asteraceae. Rev. Latinoamer. Quim. (in press).
- GRAY, A. 1883. Contributions to North American Botany. I. Characters of new Compositae, with revisions of certain genera, and critical notes. Proc. Amer. Acad. Arts 19:1–73.
- GREENMAN, J.M. 1905. Diagnoses and synonymy of Mexican and Central American Spermatophytes. Proc. Amer. Acad. Arts 40:28–52.
- HUMBOLDT, A., A. BONPLAND & C.S. KUNTH. 1820. Nova Genera et Species Plantarum 4:200–206. Paris.
- KEIL, D.J., & T.F. STUESSY. 1977. Chromosome counts of Compositae from Mexico and the United States. Amer. J. Bot. 64:791–798.
- MCVAUGH, R. 1984. *Verbesina*, in Flora Novo-galiciana 12:963–1013.
- NASH, D. 1976. *Verbesina*, in Flora of Guatemala. Fieldiana Bot. 24(12):332–347.

- OLSEN, J. 1985. Synopsis of *Verbesina* sect. *Ochraetinia* (Asteraceae). *Pl. Syst. Evol.* 149:47 – 63.
- . 1986. Revision of *Verbesina* section *Verbesina* (Asteraceae). *Brittonia* 38:362 – 368.
- ROBINSON, B.L., & J.M. GREENMAN. 1899. Synopsis of the genus *Verbesina*, with an analytical key to the species. *Proc. Amer. Acad. Arts* 34:534 – 564.
- STUESSY, T.F. 1977. Heliantheae - Systematic Review. in, V.H. Heywood, J.B. Harborne & B.L. Turner eds. *The Biology and Chemistry of the Compositae*. 2:621 – 671. London and New York: Academic Press.
- SUNDBERG, S., C.P. COWAN & B.L. TURNER. 1986. Chromosome counts of Latin American Compositae. *Amer. J. Bot.* 73:33 – 38.
- TURNER, B.L. 1985. Revision of *Verbesina* sect. *Pseudomontanoa* (Asteraceae). *Pl. Syst. Evol.* 150:237 – 262.
- . W.L. ELLISON & R.M. KING, 1961. Chromosome numbers in the Compositae IV. North American species, with phyletic interpretations. *Amer. J. Bot.* 48:216 – 233.
- & J. OLSEN. 1988. Two new species of *Verbesina* sect. *Platypteris* (Asteraceae) from Jalisco, Mexico. *Sida* 13:39 – 43.
- , A.M. POWELL & R.M. KING. 1962. Chromosome numbers in the Compositae VI. Additional Mexican and Guatemalan species. *Rhodora* 64:251 – 271.